

What is claimed is:

1. A metallic plate and a resin structure characterized in that the plate and the structure are obtainable by laminating a photocatalyst-supporting film onto the surface of a metallic plate or a resin substrate by heat-pressing and are having photocatalytic activity capable of decomposing triolein at a rate of $5 \mu\text{g}/\text{cm}^2/\text{day}$ or more when irradiating UV rays in UV-A range at a strength of $3 \text{ mW}/\text{cm}^2$ under an atmospheric temperature of 25°C and relative humidity of 70%.

2. The metallic plate and the resin structure laminated with a photocatalyst-supporting film according to Claim 1 characterized in that the photocatalyst-supporting film is made of polymer resin film in which a photocatalyst layer is carried on the film via an adhesive layer.

3. The metallic plate and the resin structure laminated with a photocatalyst-supporting film according to Claim 2 characterized in that the polymer resin film is a film on which 2 or more resin films are laminated.

4. The metallic plate and the resin structure laminated with a photocatalyst-supporting film according to Claim 2 ~~or Claim 3~~ characterized in that the polymer resin film is made of a resin selected from a group consisting of polycarbonate resins, copolymers of 2 or more of polymethylmethacrylate resins or polyacrylate resins, poly(vinyl chloride) resins and cellophane resins.

5. The metallic plate and the resin structure laminated with a photocatalyst-supporting film according to ^{claim 2} ~~any of Claims 2 through 4~~ characterized in that the thickness of the polymer resin film is in a range of from 5 to $200 \mu\text{m}$.

6. The metallic plate and the resin structure laminated with a photocatalyst-supporting film according to ^{claim 2} ~~any of Claims 2 through 5~~ characterized in that the adhesive layer is formed by coating a coating solution for an adhesive layer containing a silane coupler as a hardener.

7. The metallic plate and the resin structure laminated with a photocatalyst-supporting film according to ^{claim 2} ~~any of Claims 2 through 6~~ characterized in that a coating solution for an adhesive layer prepared by adding a silane coupler in an amount of 0.1-5% by weight relative to

the weight of the coating solution as a hardener to a coating solution composed of a silicon denaturated resin in an amount of 2-20% by weight which contains either polysiloxane in an amount of 10-50% by weight or colloidal silica in an amount of 5-30% by weight is used for the coating solution for an adhesive layer.

8. The metallic plate and the resin structure laminated with a photocatalyst-supporting film according to Claim 6 characterized in that a coating solution prepared by adding a silane coupler as a hardener in an amount of 0.1-5% by weight relative to the weight of the coating solution into a solution containing either monoalkyltrimethoxysilanes or its hydrolyzed product in an amount of 1-10% by weight and silica sol in an amount of 0.1-5% by weight is used as the coating solution for an adhesive layer.

9. The metallic plate and the resin structure laminated with a photocatalyst-supporting film according to ~~any of Claims 2 through 8~~ ^{Claim 2} characterized in that the thickness of the adhesive layer is in a range of from 0.5 to 5 μm .

10. The metallic plate and the resin structure laminated with a photocatalyst-supporting film according to ~~any of Claims 2 through 9~~ ^{Claim 2} characterized in that the photocatalyst layer contains a metal oxide sol in an amount of 1-10% by weight as solid component and titanium dioxide in an amount of 1-10% by weight as solid component.

11. The metallic plate and the resin structure laminated with a photocatalyst-supporting film according to ~~any of Claims 2 through 9~~ ^{Claim 2} characterized in that the photocatalyst layer contains silica sol in an amount of 1-10% by weight, either of monoalkyltrimethoxysilane or its hydrolyzed product in an amount of 1-10% by weight and titanium dioxide in an amount of 1-10% by weight.

12. The metallic plate and the resin structure laminated with a photocatalyst-supporting film according to Claim 10 ~~or Claim 11~~ characterized in that the thickness of the photocatalyst layer is in a range of from 0.1 to 5 μm .

13. The metallic plate laminated with a photocatalyst-supporting film according to ~~any of Claims 1 through 12~~ ^{Claim 1} characterized in that the metallic plate is a metallic plate selected from a group consisting of iron plate, steel plate, aluminium plate and aluminium alloy plate.

14. The metallic plate laminated with a photocatalyst-supporting film according to ~~any of Claims 1 through 13~~ ^{claim 1} characterized in that the metallic plate is any of resin-coated metallic plate, paint-coated metallic plate and enamelled metallic plate, which are coated in either single or multiple layers with one or more resins selected from a group consisting of poly(vinyl chloride) resins, polyethyleneterephthalate resins and polymethylmethacrylate resins.

15. The metallic plate laminated with a photocatalyst-supporting film according to ~~any of Claims 1 through 14~~ ^{claim 1} characterized in that the shape of the metallic plate is any of plate-form, tubular and corrugated-form.

16. The resin structure laminated with a photocatalyst-supporting film according to ~~any of Claims 1 through 12~~ ^{claim 1} characterized in that the resin substrate is made of a resin selected from a group consisting of poly(vinyl chloride) resins, polyethyleneterephthalate resins, polymethylmethacrylate resins, polycarbonate resins, polyethylene resins, polypropylene resins, shock-resistant denaturated polystyrene resins, and acryl-butadiene-styrene copolymers.

17. The resin structure laminated with a photocatalyst-supporting film according to ~~any of Claims 1 through 12 and Claim 10~~ ^{claim 1} characterized in that the shape of the resin substrate is plate-form, sheet-like, woven fabric-like, nonwoven fabric-like, resin-containing reinforced fabric-like or tubular.

18. A method for preparing the metallic plate and the resin structure laminated with a photocatalyst-supporting film according to ~~any of Claims 1 through 17~~ ^{claim 1} characterized in that the laminated metallic plate or the resin structure is prepared firstly by coating a coating solution for an adhesive layer wherein a silane coupler as a hardener is added onto a polymer resin film and then drying it and subsequently coating a coating solution for a photocatalyst layer onto the adhesive layer and then drying it to prepare a photocatalyst-supporting film which carries the photocatalyst layer on the polymer resin film via the adhesive layer, and then laminating the photocatalyst-supporting film onto the surface of a metallic plate or a resin substrate by applying heating and pressing.

19. Reflection plates for lighting equipments, outdoor-use

signboards and other signs, home-use electric appliances, guardrails and road signs using either the metallic plate or the resin structure laminated with a photocatalyst-supporting film according to ~~any of~~ ^{Claim 1} ~~Claims 1 through 15~~ at least for the part of them.

20. Outdoor-use signboards and other signs, telephone box, materials for outdoor tents, washstands, modular bathes, systematic kitchens, water tanks for ornamental fishes, plastic cases, wall papers, food-use trays, and packaging films using the resin structure laminated with a photocatalyst-supporting film according to ~~any of Claims 1 through 12 and 16 and 17~~ ^{Claim 1} at least for the part of them.

21. A coating agent for adhering a photocatalyst for preparing a photocatalyst layer onto a polymer resin film via an adhesive layer characterized in that the coating agent is prepared by adding a silane coupler in an amount of 0.1-5% by weight relative to the weight of a coating solution for the adhesive layer as a hardening agent into the coating solution for an adhesive layer containing 2-20% by weight of silicon denaturated resin, which contains either polysiloxane in an amount of 10-50% by weight or colloidal silica in an amount of 5-30% by weight.

22. A coating agent for adhering a photocatalyst for preparing a photocatalyst layer onto a polymer resin film via an adhesive layer characterized in that the coating agent is prepared by adding a silane coupler in an amount of 0.1-5% by weight relative to the weight of a coating solution for an adhesive layer as a hardener into the coating solution for an adhesive layer containing either monoalkyltrimethoxysilane or its hydrolyzed product, polysiloxane, in an amount of 1-10% by weight and silica sol in an amount of 0.1-5%.